

Neonatal Abstinence Syndrome

Modified Finnegan Scoring System

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Neonatal Abstinence Syndrome

- A group of symptoms
- Develop after birth
- Baby no longer getting a certain drug or medicine (illicit or prescription) he/she was receiving while in utero
- Most often seen with opioid exposure
- Can be sedatives, polysubstances, nicotine, alcohol
- Develops in 55-94% of drug exposed infants

Preterm Infants & NAS

- May exhibit fewer signs of withdrawal
 - Immaturity
 - Less total body fat
 - Difference in total drug exposure

Clinical Signs of Withdrawal

Neurological	Autonomic	Gastrointestinal
<ul style="list-style-type: none"> • Irritability • Increased wakefulness • High-pitched cry • Tremor • Increased muscle tone • Hyperactive deep tendon reflexes • Frequent yawning • Sneezing • Seizures 	<ul style="list-style-type: none"> • Diaphoresis • Nasal stuffiness • Fever • Mottling • Temperature instability • Mild elevations in respiratory rate and blood pressure 	<ul style="list-style-type: none"> • Vomiting • Diarrhea • Dehydration • Poor weight gain • Poor feeding • Uncoordinated & constant sucking

Onset of Withdrawal Symptoms

Drug	Approximate time to onset of withdrawal (W/D) symptoms
Alcohol	3-12 hours
Barbiturates	4-7 days but can range from 1-14 days
Cocaine	Usually no W/D signs but sometimes neurobehavioral abnormalities (↓ arousal & physiologic stress) occur at 48-60 hours
Heroin	Within 24 hours
Marijuana	Usually no clinical W/D signs
Methadone	3 days but up to 5-7 days, severity varies
Methamphetamines	Usually no W/D signs but sometimes neurobehavioral abnormalities 48-60 hours
Opioids	24-36 hours but can be up to 5-7 days
Sedatives	1-3 days
SSRI's	Several hours to several days

Modified Finnegan Scoring System

- A semi-subjective scoring system
- List of 21 symptoms
 - Symptoms often seen with drug-exposed infants
 - Score assigned for each symptom and associated degree of severity
 - The total abstinence score is determined by totaling the score assigned to each symptom over the scoring period

NEONATAL ABSTINENCE SCORING (NAS) - LAST EDITION (2014)

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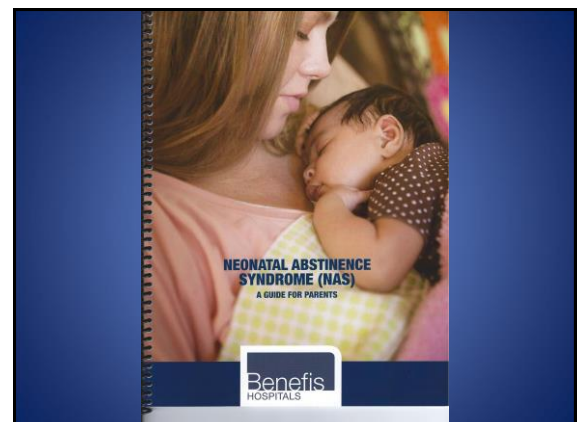
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NAS- Scoring Tool- Modified Finnegan Scoring System

- Designed for term infants on 4 hour feeding schedule
- Needs to be modified for preterm infants.
- Infants should not be awakened to score.

Assessment and Scoring

- A crying baby should be soothed and quieted before assessing muscle tone, Moro reflex and respiratory rate.

Scoring-Key Points

- First score/Baseline score – done approximately 2 hours after birth
- Re-scoring at 3-4 hour intervals
- Scoring is dynamic
 - All signs and symptoms observed during the scoring interval are included in the point total for that period.

Central Nervous System Disturbances

Signs:
Cry
Sleep
Moro Reflex
Tremors
Muscle Tone
Excoriation
Myoclonic Jerks
Seizures

Crying

- Normally infant will use self-consoling measures such as finger sucking or fist sucking to diminish or eliminate crying within a 15 second period of time
- Offer holding, rocking or pacifier
- These measures usually work unless extremely hungry, in pain or in major discomfort due to a pathological condition

Excessive or high-pitched crying

- Score 2: Score 3: Unable to use self-consoling measures with in 15 seconds
- Cries intermittently or continuously for less than 5 minutes despite interventions
- Score whether the cry is high-pitched or not



Continuous High-Pitched Crying

- Score 3: Unable to use self-consoling measures within 15 seconds
- Cries intermittently or continuously for greater than 5 minutes despite interventions
- Score whether the cry is high-pitched or not



Sleep

- Based on the longest period of light or deep sleep displayed by the infant, within the entire scoring interval

Sleep

- Scale of increasing severity
 - 1 score from the 3 levels of severity
 - Preterm- if eating every 3 hours can sleep for 2 ½ hours.
- If a 3 hour scoring period is used due to a 3 hour medication schedule, do not score the “sleeps less than 3 hours” unless infant wakes on their own after sleeping at least 2 hours

Sleep

- Score 3- if sleeps <1 hour
- Score 2- if sleeps < 2 hours
- Score 1- if sleeps <3 hours
- Score 0- if infant does not awaken spontaneously

Moro Reflex

- Prior to eliciting this reflex, quiet if irritable or crying
- Definitions:
 - Jittery- symmetric & involuntary rhythmic tremors
 - Clonus- involuntary repetitive jerks (out/in movements) of wrist or ankle

Moro Reflex

- Normal newborn reflex
- Lift infant off the crib by arms and allow to gently fall back onto mattress
- Arms should straighten and elbows will move away from the body
- Extension of the wrist & fanning/opening of the fingers
- Arms return to the chest and may begin to cross over each other

Moro reflex

- Score 2: pronounced jitteriness (rhythmic tremors that are symmetrical and involuntary) of the hands during or at the end of a Moro reflex.
- Score 3: jitteriness and clonus (repetitive involuntary jerks) of the hands and / or arms are present during or after the initiation of the reflex.

Tremors

- Tremors- involuntary rhythmic movements/quivers with equal amplitude occurring at a fixed point
- Scale of increasing severity
- Baby should only receive one score from the 4 levels of severity
- Undisturbed refers to baby asleep or at rest in crib

Tremors- Disturbed

- Mild tremors:
-Score 1 if tremors of the hand or foot when handled
- Moderate-severe:
-Score 2 if tremors of the arms or legs, with or without tremors of hands and feet when handled

Tremors- Undisturbed

- Mild tremors:
- Score 3 if tremors of hand or foot when not being handled
- Score 4 if tremors of arms or legs with or without tremors of the hands or feet when not being handled

Increased Muscle Tone

- The ability of the muscle to resist movement
- Do not assess tone when asleep or crying
- Wake and/or comfort a crying infant prior to testing

Increased muscle tone

- Score 2: if excessive or above-normal muscle tone or tension is observed
 - muscles become “stiff” or rigid and the baby shows marked resistance to passive movements.
- Example:
 - no head lag when being pulled to the sitting position;
 - if there is tight flexion of the baby’s arms & legs (unable to slightly extend these when an attempt is made to extend and release the supine infant’s arms & legs)

Excoriation

- Skin abrasions- result from constant rubbing against a surface
- Score when excoriations first appear, increase or appear in a new area
- Continue to score until the rub marks are no longer present.



Myoclonic jerks

- Score 3: if involuntary muscular contractions
- Twitching or jerking of limbs
 - irregular
 - exceedingly abrupt (usually involving a single group of muscles)

Generalized seizures

- Referred to as tonic seizures
- Most often a generalized activity involving tonic extensions of all limbs
- Sometimes limited to one or both limbs on one side
- Activity doesn't stop if limb is held

Generalized seizures-cont.

- Swimming
- Rowing
- Pedaling
- Bicycling
- Eye staring
- Rapid involuntary movements of eyes
- Chewing
- Back arching
- Fist clenching

Metabolic /Vasomotor/Respiratory Disturbances

Signs:	
Fever	Sweating
Yawning	Mottling
Nasal Stuffiness	Sneezing
Nasal Flaring	Respiratory rate

Sweating

- Score 1 If: spontaneous sweating
 - not due to excessive clothing or high room temperature
- Moisture on forehead, upper lip or back of neck

Hyperthermia

- Temperature taken per axilla
- Mild pyrexia- 99-100° is an early indication of heat produced by increased muscle tone or tremors
 - Score 1 if: 99-101°
 - Score 2 if :> 101°

Yawning

- Score 1 if: more than 3 yawns observed within the scoring interval



Mottling

- Score 1 if: mottling (marbled appearance of pink and pale or white areas) is present on the baby's chest, trunk, arms or legs.



Nasal stuffiness

- Score 1 if: nasal drainage with or without stuffy nose

Sneezing

- Score 1 if: more than 3-4 sneezes observed within the scoring interval

Nasal flaring

- Score 2 : Outward spreading of the nostrils is observed

Respiratory rate

- Infant should be quieted if crying prior to counting respiratory rate
- Score 1 if: >60 per minute without other evidence of lung or airways disease
- Score 2 if: respirations > 60 per minute & involve retractions

Gastrointestinal Disturbances

Signs:		
Sucking	Feeding	Regurgitation
Projectile Vomiting	Loose Stools	Watery Stools

Excessive sucking

- Score 1 :
 - hyperactive/disorganized sucking
 - increased rooting with swiping movements of hand across mouth
 - Attempting to suck on pacifier while moving head side to side, unable to suck on pacifier adequately

Poor feeding

- Score 2 if: baby demonstrates excessive sucking prior to feeding, yet sucks infrequently during a feeding taking inadequate volumes
- Demonstrates an uncoordinated sucking reflex (difficulty sucking and swallowing) gulping and stopping frequently to breathe

Poor feeding- Prematures

- Premature infants may require tube feeding and should not be scored for poor feeding if tube feeding is expected for their gestation

Regurgitation / vomiting

- Score 2 if: > 2 times during or after feeding- not associated with burping
- Score 3 if: projectile vomiting- one or more episode(s) occur during or immediately after a feeding

Loose stools / diarrhea

- Score 2 if loose (curds/seedy appearance)
 - May or may not be explosive
- Score 3 if watery stools (water ring on diaper around stool) are observed
- Check the diaper after the exam is completed- if irritated bottom noted

Consider Treatment

If scores are:

- ≥ 8 for 3 consecutive scores
- ≥ 12 for 2 consecutive scores



Pharmacologic Treatment

- Morphine- shorter half life, thus easier to see response
- Start at 0.05mg /kg every 3 hours
- Start to wean if average scores <8
- Wean by 10% daily
- Consider using Tylenol
- Consider using Mylicon (simethicone)
- Non- Pharmacological interventions

Goal

- Score of < 8
 - Allows for appropriate drug weaning
- Discharge
 - Score < 8 off medications for 24- 72 hours

Nursing Interventions: Comfort measures

Excessive or high-pitched crying

- Reduce environmental stimuli
- Hold firmly and close to the body
- Gentle rocking, talking/singing/humming
- Use of infant swing



Sleeplessness

- Wrap or swaddle baby
- Minimal handling
- Skin to skin
- Use swing
- Feed baby on demand



Myoclonic Jerks, Tremors, Jitteriness, Irritability

- Prepare everything prior to disturbing the baby to minimize handling
- Slow movements
- Reduced lighting
- Reduced noise levels
- Soft music
- Massage
- Relaxation baths

Excoriation

- Tegaderm® to knees and elbows
- Clean skin regularly
- Dry clothing and bedding to prevent skin infection

Hyperthermia

- Ensure adequate hydration
- Reduce environmental temperature
- Avoid heavy bedding
- Dress or swaddle in loose light fabrics
- Skin to skin contact with mother

Nasal Stuffiness / Excessive Nasal Secretions

- Use gentle suction if nasal secretions cause obstruction to ensure adequate respiratory function

Excessive Sucking

- Apply mittens if trauma to fingers.
- Offer pacifier- for nonnutritive sucking.



Poor Feeding

- Feed on demand
- Reduce environmental stimuli during feeding
- Frequent small feeds with rest between sucking
- Assess coordination of suck/swallow reflex- support cheeks and jaw if necessary
- If insufficient fluid intake notify Medical Staff
- May need hypercaloric formula

Regurgitation / vomiting

- Burp frequently when baby stops sucking & at end of feeding



Loose/watery stools

- Frequent diaper changes
- Use barrier creams
- Occasional skin exposure to allow bottom to dry



- Achieving reliable scores using the Modified Finnegan Neonatal Scoring Tool can be done by:
 - Establishing set descriptions of the criterion scored
 - Education of staff
 - Consider reassessing inter-rater reliability among staff

Thank you !